General

Title

End stage renal disease (ESRD): risk-adjusted standardized transfusion ratio (STrR) for dialysis facility patients.

Source(s)

Standardized transfusion ratio (STrR) measure information form. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 7 p.

Measure Domain

Primary Measure Domain

Related Health Care Delivery Measures: Use of Services

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the risk-adjusted standardized transfusion ratio (STrR) for dialysis facility patients.

The STrR is a ratio of the number of transfusion events among eligible patients at the facility during the reporting period to the number of transfusion events that would be expected among eligible patients at the facility during the reporting period, given the patient mix at the facility.

Rationale

Several changes in the end stage renal disease (ESRD) system are likely to impact anemia management. These include identification of safety concerns associated with aggressive erythropoiesisâ€stimulating agent (ESA) use, expansion of the ESRD Prospective Payment System bundled payment, and the development of the ESRD Quality Incentive Program. There are concerns that these changes could result in underutilization of ESAs, with lower achieved hemoglobin values that may increase the frequency of red

blood cell transfusion in the United States (U.S.) chronic dialysis population.

Blood transfusion may be an indicator for underutilization of treatments to increase endogenous red blood cell production (e.g., ESA, iron). In addition, dialysis patients who are eligible for kidney transplant and are transfused risk the development of becoming sensitized to the donor pool thereby making transplant more difficult to accomplish. Blood transfusions carry a small risk of transmitting blood borne infections, development of a transfusion reaction, and using infusion centers or hospitals to transfuse patients is expensive, inconvenient, and could compromise future vascular access.

Monitoring the riskâ€adjusted transfusion rate at the dialysis facility level, relative to a national standard, allows for detection of treatment patterns in dialysisâ€related anemia management. This is of particular importance due to recent U.S. Food and Drug Administration (FDA) guidance regarding minimizing the use of ESAs and new economic incentives to minimize ESA use introduced by Medicare bundling payment for ESAs. As providers use less ESAs in an effort to minimize the risks associated with aggressive anemia treatment it becomes more important to monitor for an overreliance on transfusions.

Clinical Recommendations Statement

> The Kidney Disease: Improving Global Outcomes (KDIGO) Anemia Guidelines 2012: Guideline 3.2: In initiating and maintaining ESA therapy, the KDIGO recommends balancing the potential benefits of reducing blood transfusions and anemiaâ€related symptoms against the risks of harm in individual patients (e.g., stroke, vascular access loss, hypertension).
> KDIGO Anemia Guidelines 2012: Guideline 4.1.1: When managing chronic anemia, KDIGO recommends avoiding, when possible, red cell transfusions to minimize the general risks related to their use.
> KDIGO Anemia Guidelines 2012: Guideline 4.1.3: When managing chronic anemia, KDIGO suggests that the benefits of red cell transfusions may outweigh the risks in patients in whom:
>
> - ESA therapy is ineffective (e.g., hemoglobinopathies, bone marrow failure, ESA resistance)
> - The risks of ESA therapy may outweigh its benefits (e.g., previous or current malignancy, previous stroke)

Evidence for Rationale

National Kidney Foundation. KDOQI clinical practice guidelines for anemia in chronic kidney disease. Kidney Int Suppl. 2012 Aug;4(2):279-335. [247 references]

Standardized transfusion ratio (STrR) measure information form. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 7 p.

Primary Health Components

End stage renal disease (ESRD); anemia; transfusions

Denominator Description

Number of transfusion events that would be expected among Medicare dialysis patients at the facility during the reporting period, given the patient mix at the facility (see the related "Denominator Inclusions/Exclusions" field)

Numerator Description

Number of transfusion events among eligible patients at the facility during the reporting period (see the related "Numerator Inclusions/Exclusions" field)

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

Additional Information Supporting Need for the Measure

Unspecified

Extent of Measure Testing

Unspecified

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Ambulatory Procedure/Imaging Center

Hospital Outpatient

Managed Care Plans

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

Statement of Acceptable Minimum Sample Size

Does not apply to this measure

Target Population Age

Unspecified

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Priority

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Not within an IOM Care Need

IOM Domain

Not within an IOM Domain

Data Collection for the Measure

Case Finding Period

The reporting period

Denominator Sampling Frame

Enrollees or beneficiaries

Denominator (Index) Event or Characteristic

Therapeutic Intervention

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions

Number of transfusion events that would be expected among Medicare dialysis patients at the facility during the reporting period, given the patient mix at the facility

Note: The expected number of transfusion events is calculated from a Cox model, adjusting for patient age, diabetes, duration of end stage renal disease (ESRD), nursing home status, patient comorbidities at incidence, body mass index (BMI) at incidence, and calendar year.

Exclusions

- Patients on dialysis for less than 90 days
- Patients who have not been treated at the facility for at least 60 days.
- Patient-months not within two months after a month with either: (a) $900+ of Medicare paid dialysis claims OR (b) at least one Medicare paid inpatient claim
- Transfusion events associated with a transplant
- Patient-months within one year following any claim with a comorbidity diagnosis listed among exclusions. (The intention is to exclude any time-at-risk during which treating anemia with an erythropoiesis stimulating agent [ESA] was unlikely to be a reasonable option.)

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions

Number of transfusion events among eligible patients at the facility during the reporting period

Note: The number of transfusion events includes multiple events (i.e., second, third, etc. transfusions for the same patient).

Exclusions

Unspecified

Numerator Search Strategy

Fixed time period or point in time

Data Source

Administrative clinical data

Registry data

Type of Health State

Does not apply to this measure

Instruments Used and/or Associated with the Measure

Unspecified

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Ratio

Interpretation of Score

Does not apply to this measure (i.e., there is no pre-defined preference for the measure score)

Allowance for Patient or Population Factors

not defined yet

Description of Allowance for Patient or Population Factors

Statistical Risk Model and Variables

The denominator of the "Standardized Transfusion Ratio (STrR)" uses expected transfusions calculated from a Cox model (Cox, 1972) as extended to handle repeated events (Lawless & Nadeau, 1995; Lin et al., 2000; Kalbfleisch & Prentice, 2002). For computational purposes, the Centers for Medicare & Medicaid Services (CMS) adopt a model with piecewise constant baseline rates (e.g., Cook & Lawless, 2007) and computational methodology as developed in Liu, Schaubel and Kalbfleisch (2010). A stage 1 model is first fitted to the national data with piecewise-constant baseline rates stratified by facility; transfusion rates are adjusted for patient age, diabetes, duration of end stage renal disease (ESRD), nursing home status, body mass index (BMI) at incidence, comorbidity index at incidence, and calendar year. This model allows the baseline transfusion rates to vary between strata (facilities), but assumes that the regression coefficients are the same across all strata; this approach is robust to possible differences between facilities in the patient mix being treated. The linear predictor for each patient based on the regression coefficients in the stage 1 model is used to compute a risk adjustment factor that is then used as an offset in the stage 2 model.

Detailed Risk Model Specifications

The patient characteristics included in the stage 1 model as covariates are age (18 to 24 years old, 25 to 44 years old, 45 to 59 years old, 60 to 74 years old, or 75+ years old), cause of ESRD (diabetes or other), nursing home status, BMI at incidence, comorbidity index at incidence, duration of ESRD (91 days to 6 months, 6 months to 1 year, 1 to 2 years, 2 to 3 years, 3 to 5 years, or 5+ years as of the period start date) and calendar year. Nursing home status is identified as in or not in a nursing home in the previous calendar year. The comorbidity index is calculated as a weighted linear combination of comorbidities reported on the Medical Evidence Form (CMS-2728) namely alcohol dependence, atherosclerotic heart disease, cerebrovascular disease, chronic obstructive pulmonary disease, congestive heart failure, diabetes, diabetes (currently on insulin), drug dependence, inability to ambulate, inability to transfer, malignant neoplasm, cancer, other cardiac disease, peripheral vascular disease, tobacco use (current smoker) using the same weights as used for Standardized Hospitalization Ratio. BMI is included as a log-linear term. Categorical indicator variables are included as covariates in the stage 1 model to flag records with missing values for cause of ESRD, comorbidity index, and BMI. These variables have a value of 1 if the patient is missing the corresponding piece of information and a value of 0 otherwise. Another categorical indicator variable included as a covariate to flag records where the comorbidity index is 0 has a value of 1 if the patient has a comorbidity index of 0 and a value of 0 otherwise. Beside main effects,

some two way interaction terms are also included in the model based on their clinical and statistical significance.

Refer to the original measure documentation additional information.

Standard of Comparison

not defined yet

Identifying Information

Original Title

Standardized transfusion ratio (STrR).

Measure Collection Name

End Stage Renal Disease (ESRD) Quality Measures

Submitter

Centers for Medicare & Medicaid Services - Federal Government Agency [U.S.]

Developer

Centers for Medicare & Medicaid Services - Federal Government Agency [U.S.]

Funding Source(s)

Centers for Medicare & Medicaid Services (CMS)

Composition of the Group that Developed the Measure

Arbor Research Collaborative for Health, in collaboration with the University of Michigan Kidney and Epidemiology Cost Center (UM-KECC), develop, maintain, and update the End Stage Renal Disease (ESRD) Quality Measures for the Centers for Medicare & Medicaid Services (CMS), under the Quality Measure Development and Maintenance contract with CMS.

Financial Disclosures/Other Potential Conflicts of Interest

Unspecified

Endorser

National Quality Forum - None

NQF Number

not defined yet

Date of Endorsement

2016 Dec 9

Measure Initiative(s)

Dialysis Facility Compare (DFC)

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2014 Jan

Measure Maintenance

Unspecified

Date of Next Anticipated Revision

Unspecified

Measure Status

Please note: This measure has been updated. The National Quality Measures Clearinghouse is working to update this summary.

Measure Availability

Source not available electronically.

For more information, contact Valarie Ashby at the Kidney Epidemiology and Cost Center, The University of Michigan, 1415 Washington Heights, Suite 3645 SPHI, Ann Arbor, MI 48109-2029; Phone: 734-763-6611; Fax: 734-763-4004; Email: valarieb@med.umich.edu; Web site: Dialysis Data Web site .

NQMC Status

This NQMC summary was completed by ECRI Institute on December 5, 2014. The information was verified by the measure developer on February 6, 2015.

The information was reaffirmed by the measure developer on April 22, 2016.

Copyright Statement

Production

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